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Cloutier

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(54) **GAUGE KITS FOR SHEET BENDING BRAKES**

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B21D 5/00 (2006.01)

(52) **U.S. Cl.**
CPC ***B21D 5/002*** (2013.01); ***B21D 5/042*** (2013.01); *B21D 5/04* (2013.01)

(58) **Field of Classification Search**
CPC B21D 5/006; B21D 5/04; B21D 5/002; B21D 5/042
USPC 33/626, 623, 627, 628, 630, 374, 483, 33/484, 490, 478; 72/31.01, 31.09, 31.12, 72/318, 319
See application file for complete search history.

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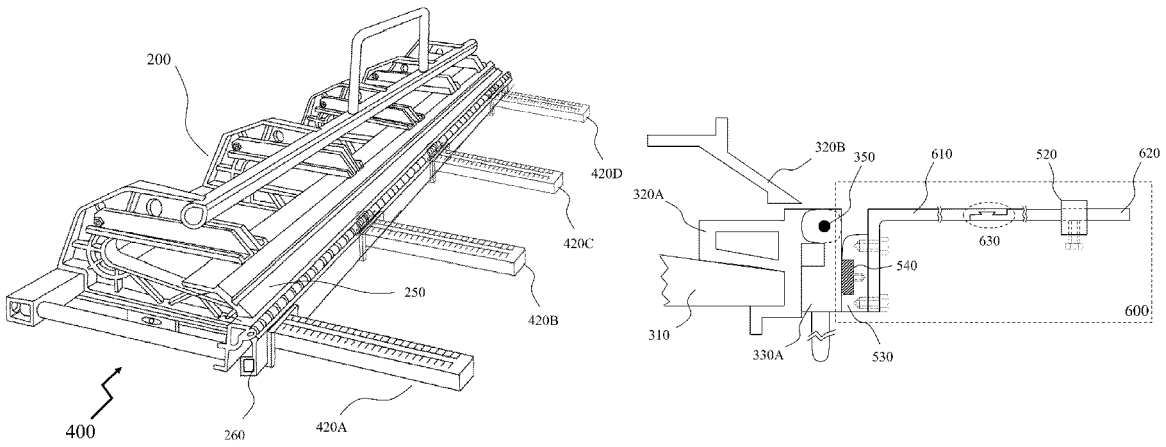
(57) **ABSTRACT**

A kit is provided, including a body for mounting to the bending bar of a sheet bending brake having a first mounting assembly for mounting to the bending bar and a first predetermined portion of a second mounting assembly for mounting a gauge plate; a gauge plate having a second predetermined portion of the second mounting assembly and an upper surface against which sheet material being bent within the sheet bending brake will be supported; and a stop dimensioned to slide along the gauge plate and including a third mounting assembly to reversibly lock the stop to the gauge plate.

12 Claims, 13 Drawing Sheets



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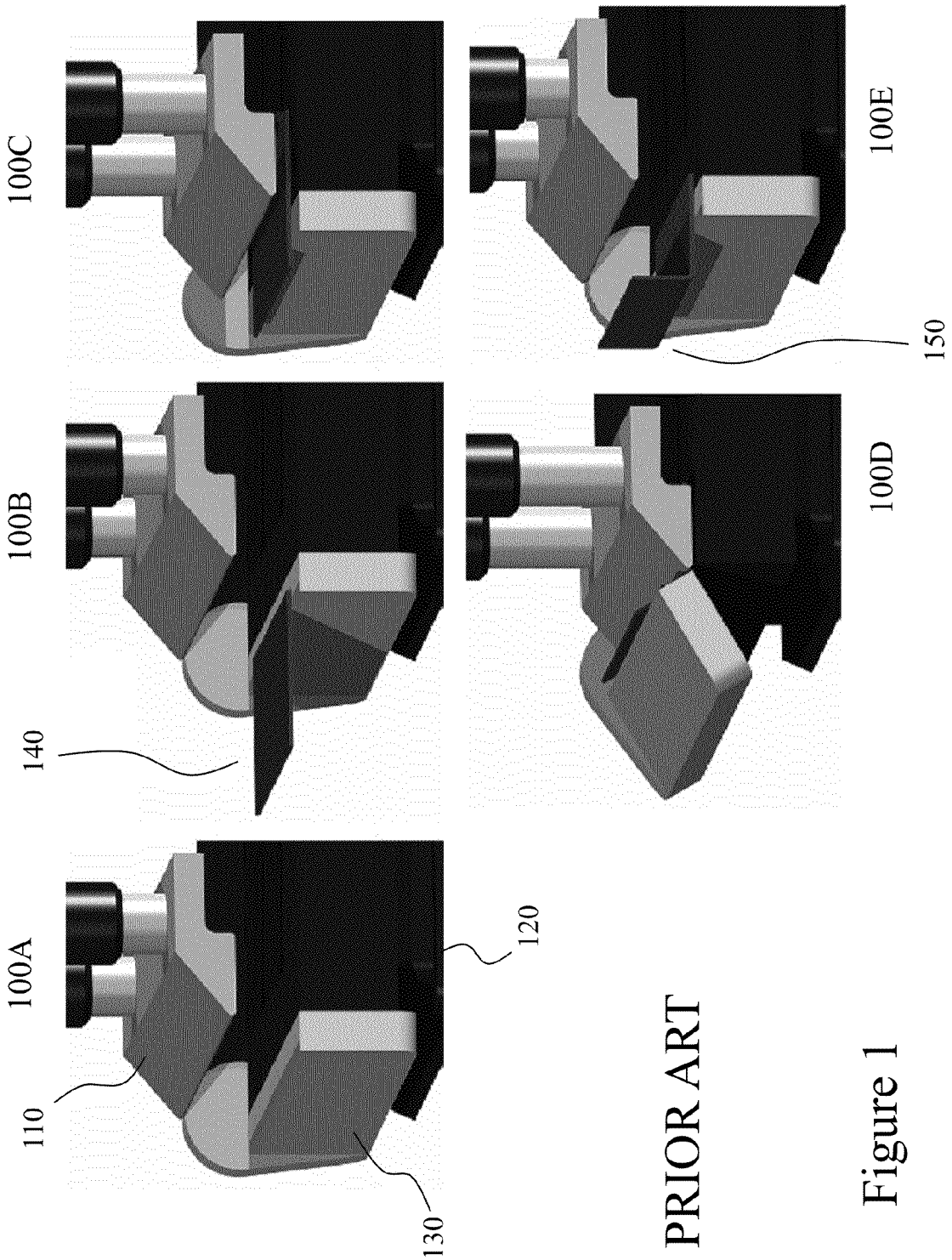
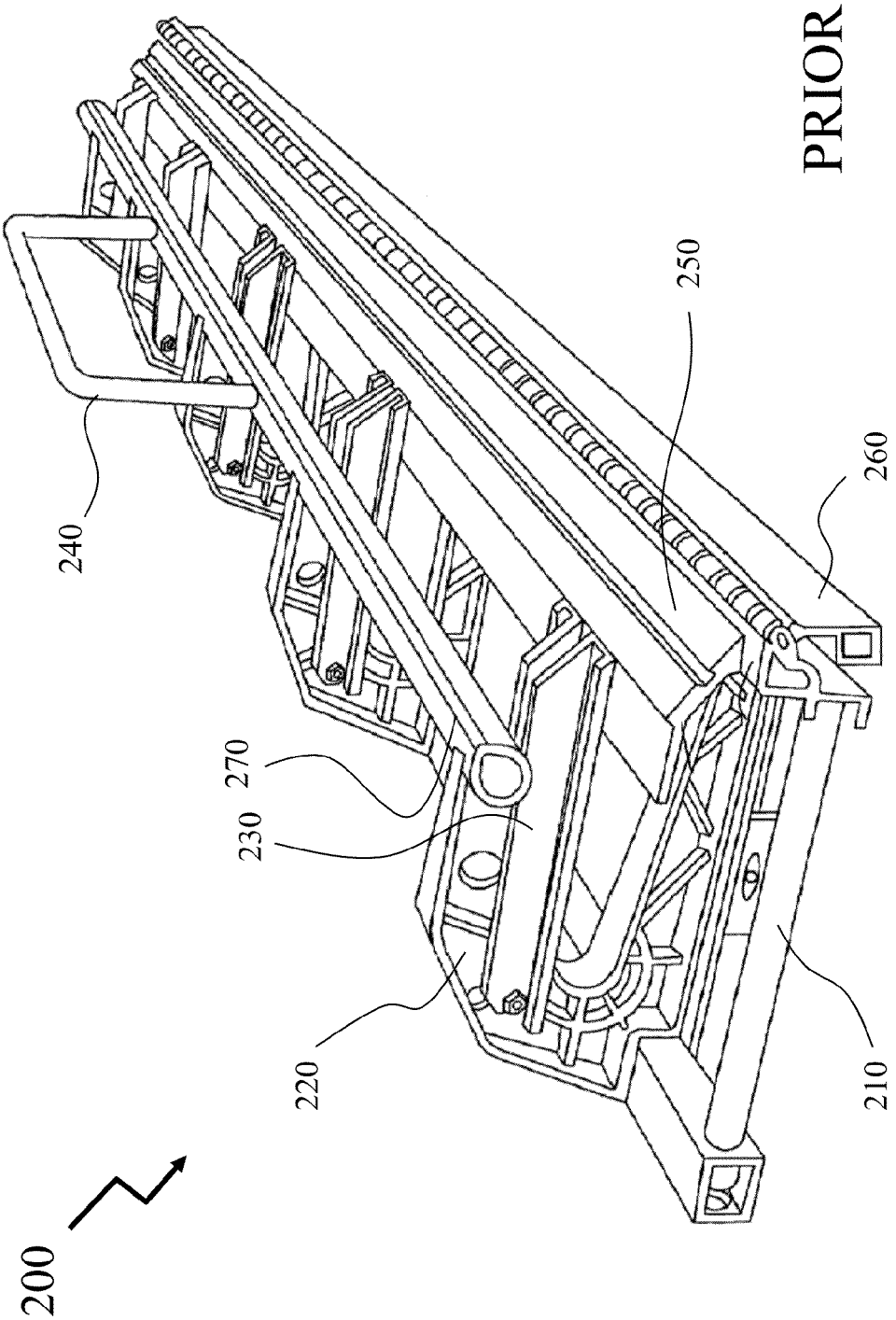


PRIOR ART

Figure 1



PRIOR ART

Figure 2

PRIOR ART

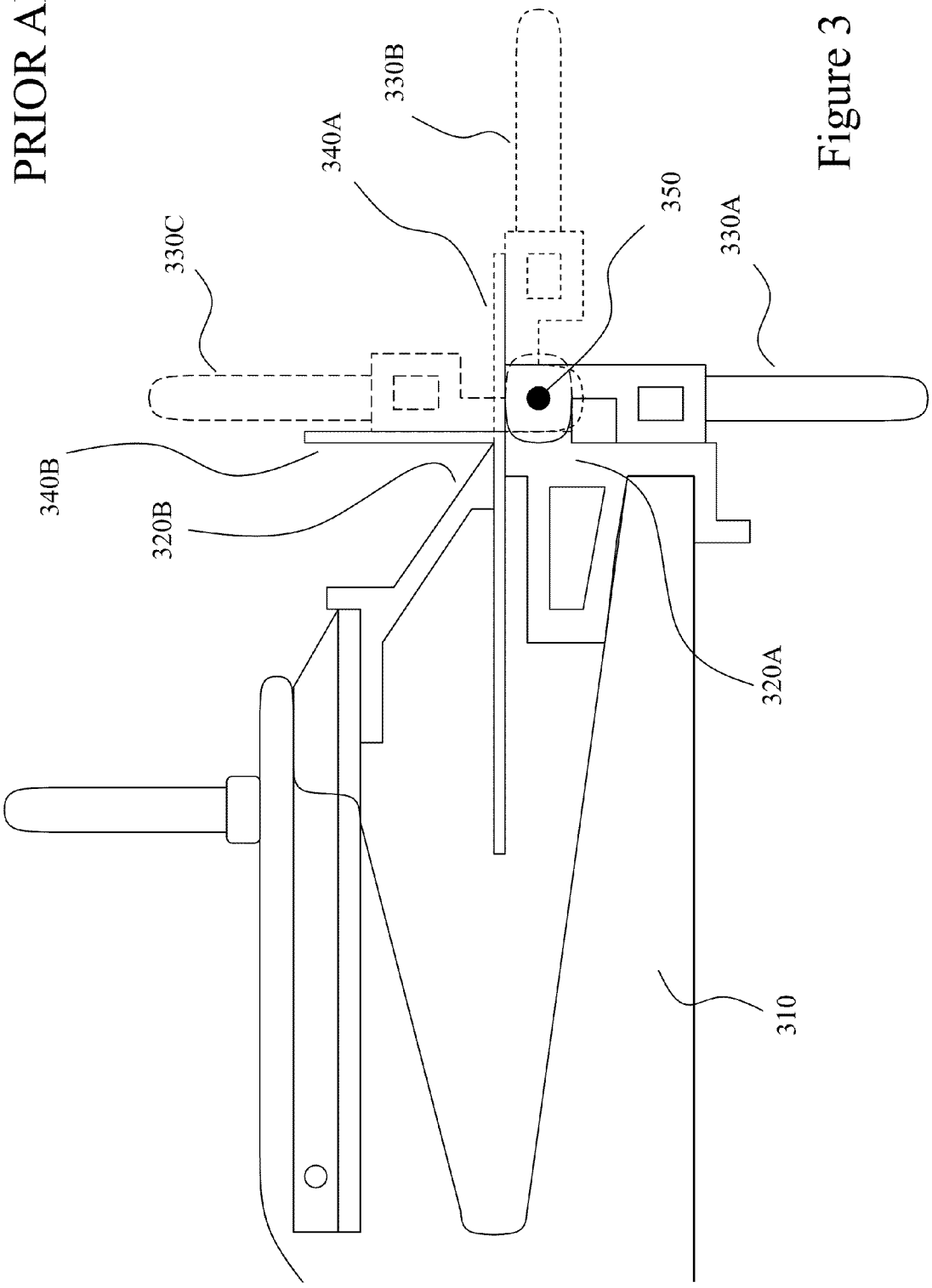


Figure 3

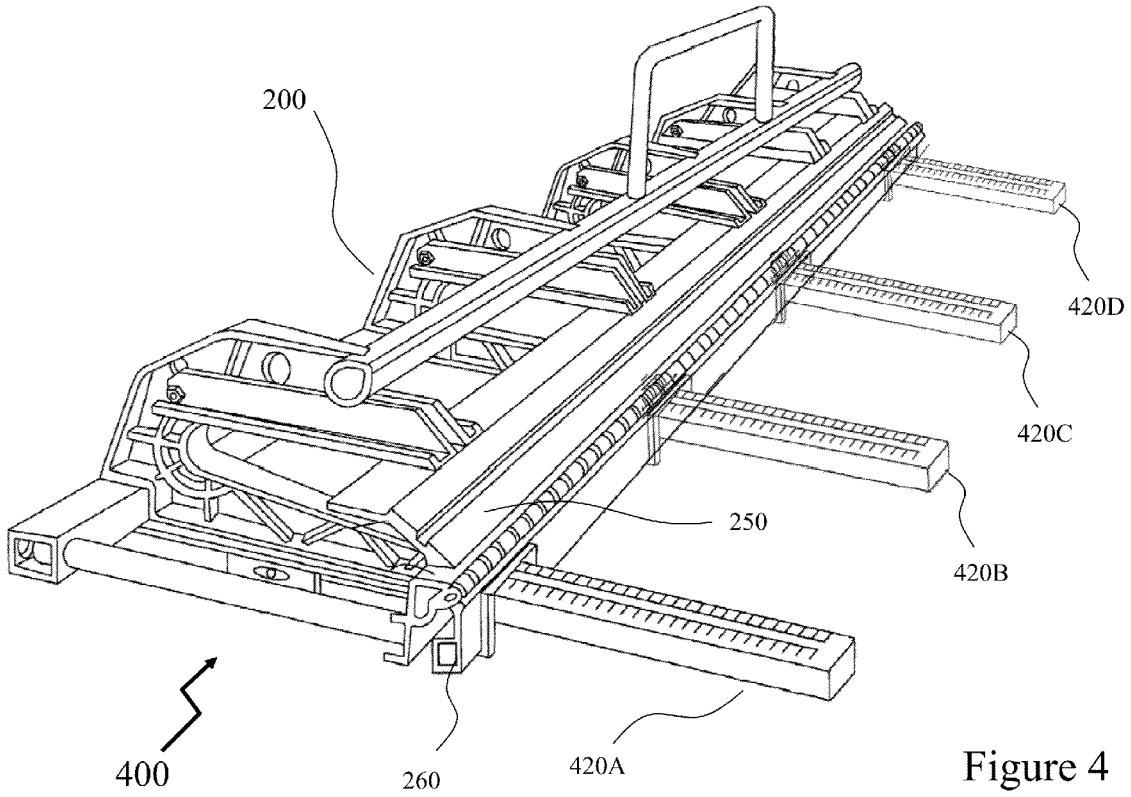
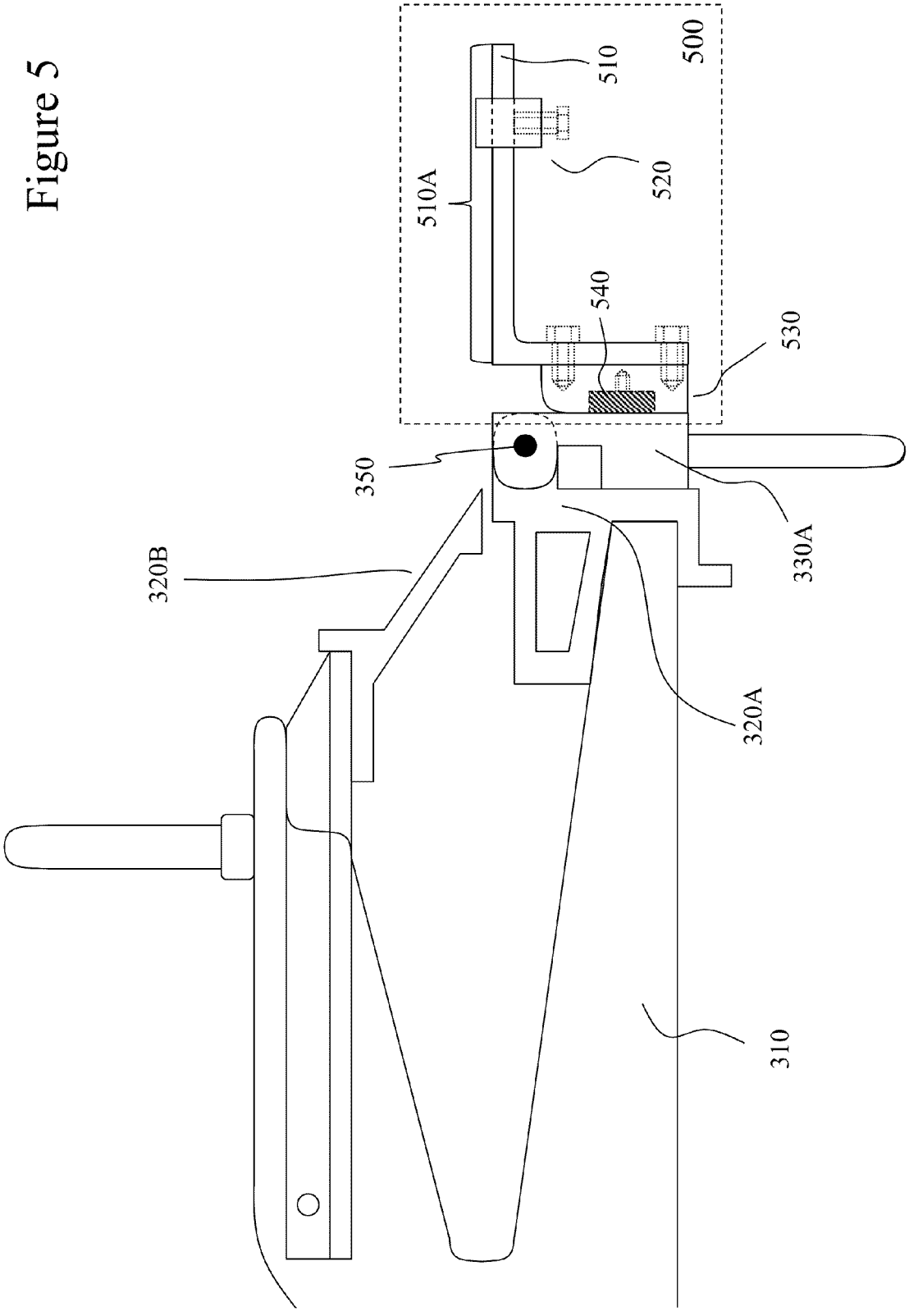


Figure 4

Figure 5



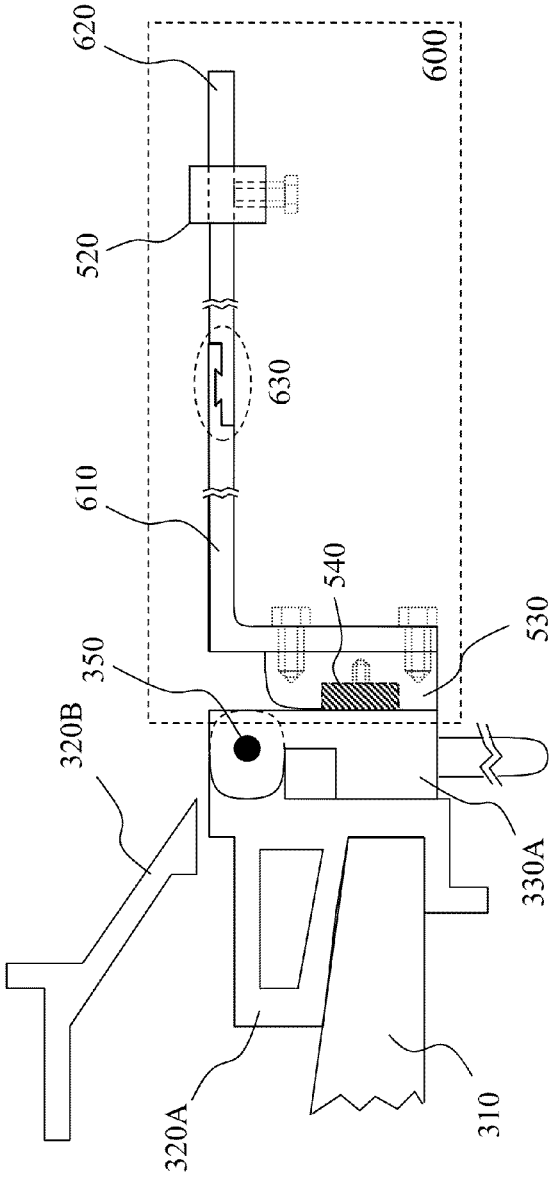


Figure 6

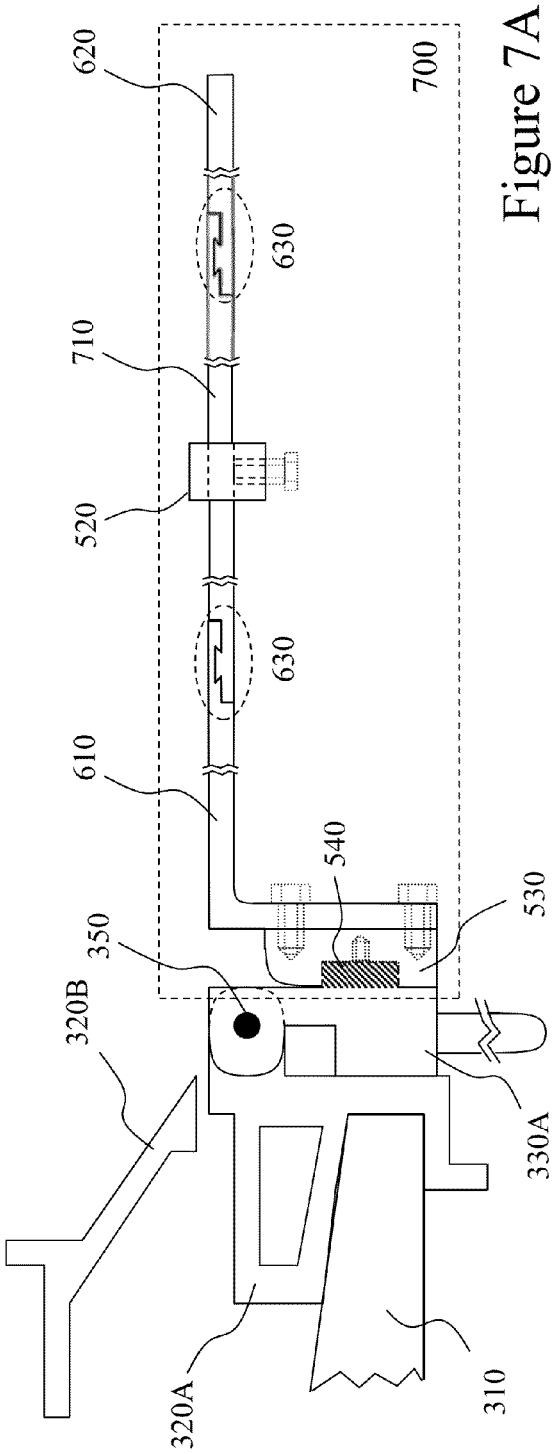


Figure 7A

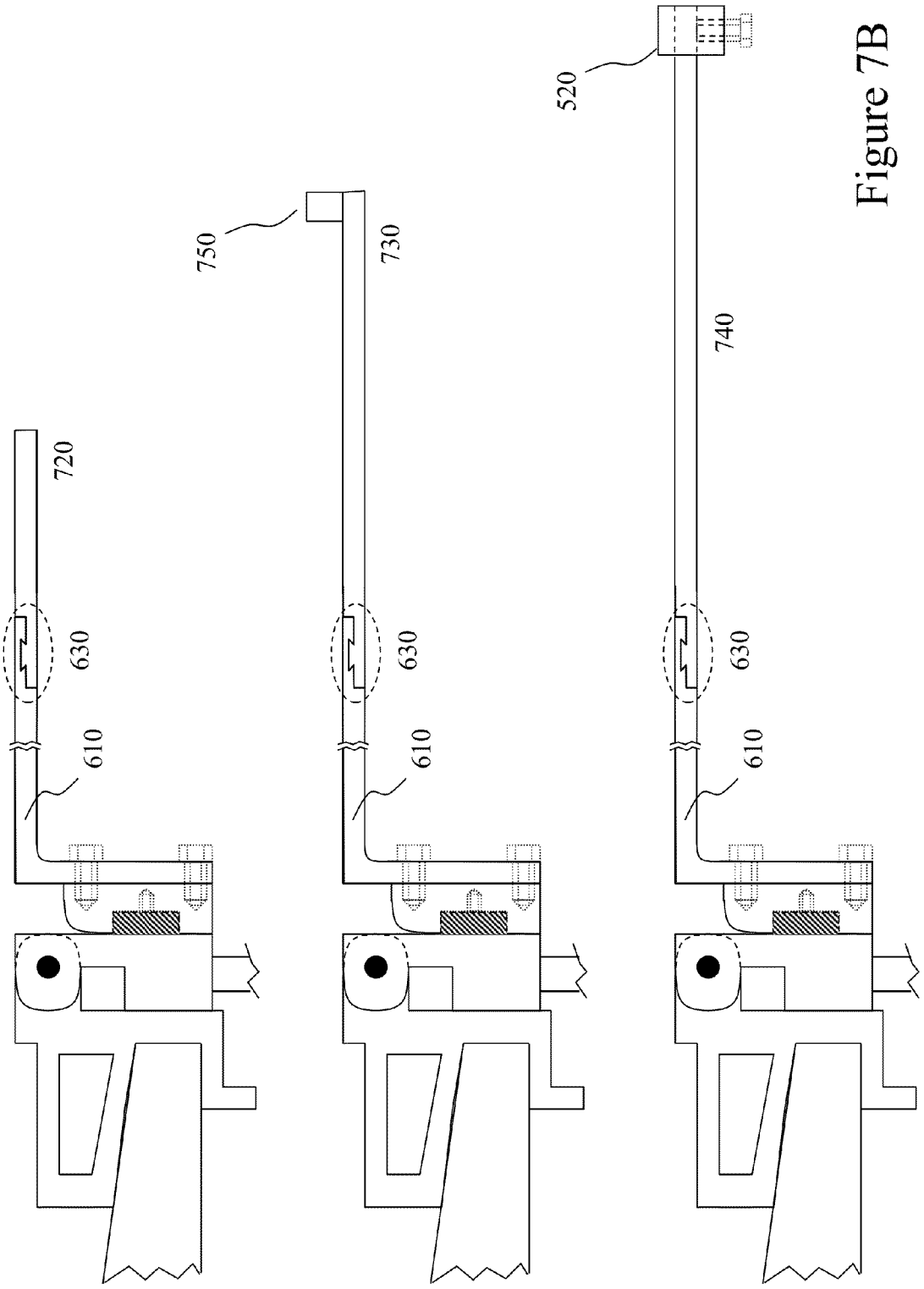
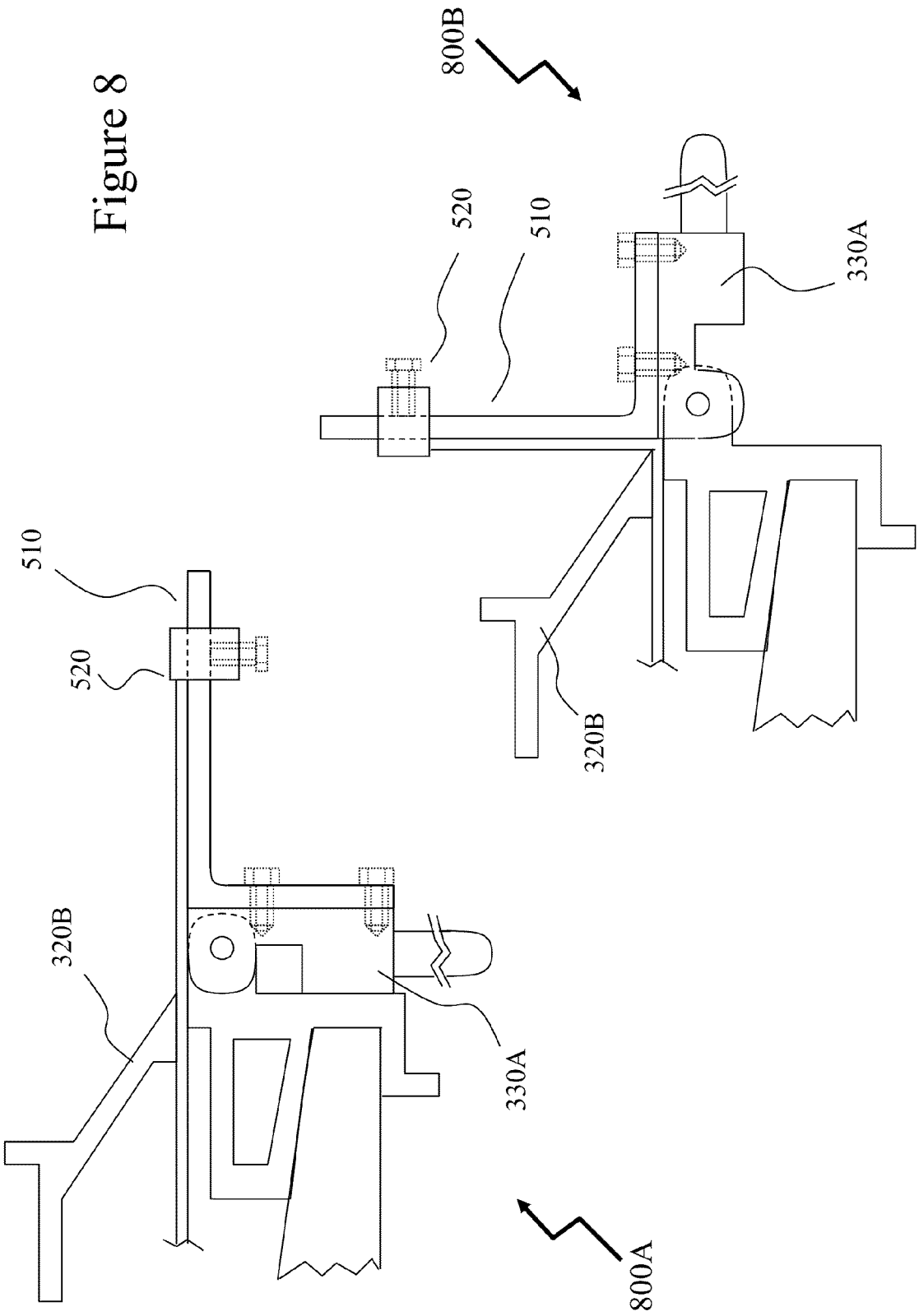


Figure 7B

Figure 8



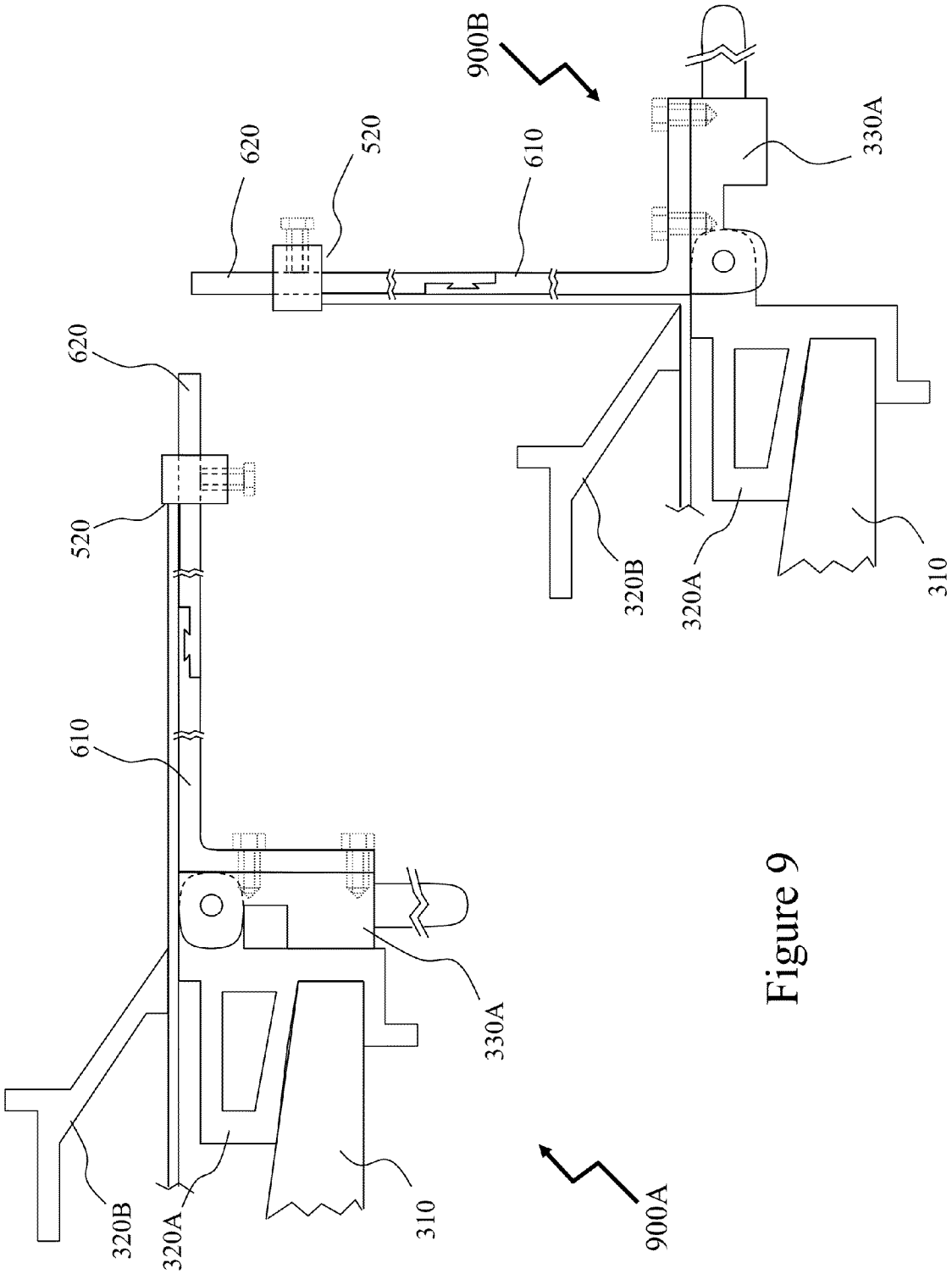

900B
620
520
610
330A
620
520
610
330A
320B
320A
310
320B
320A
310
900A

Figure 9

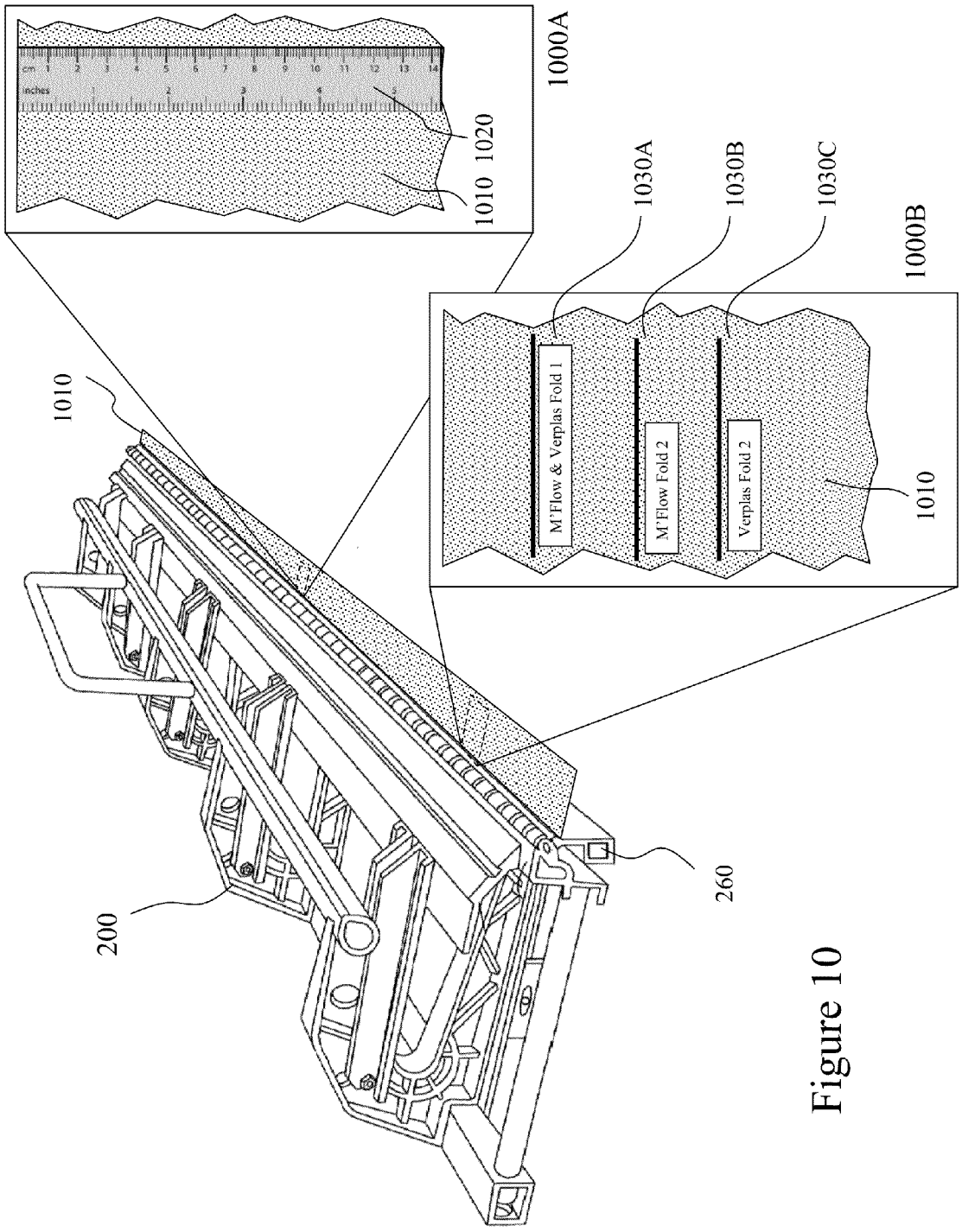

1000A
1020
1010
1030A
1030B
1030C
1000B
M'Flow & Verplas Fold 1
M'Flow Fold 2
Verplas Fold 2
1010
1010
200
260

Figure 10

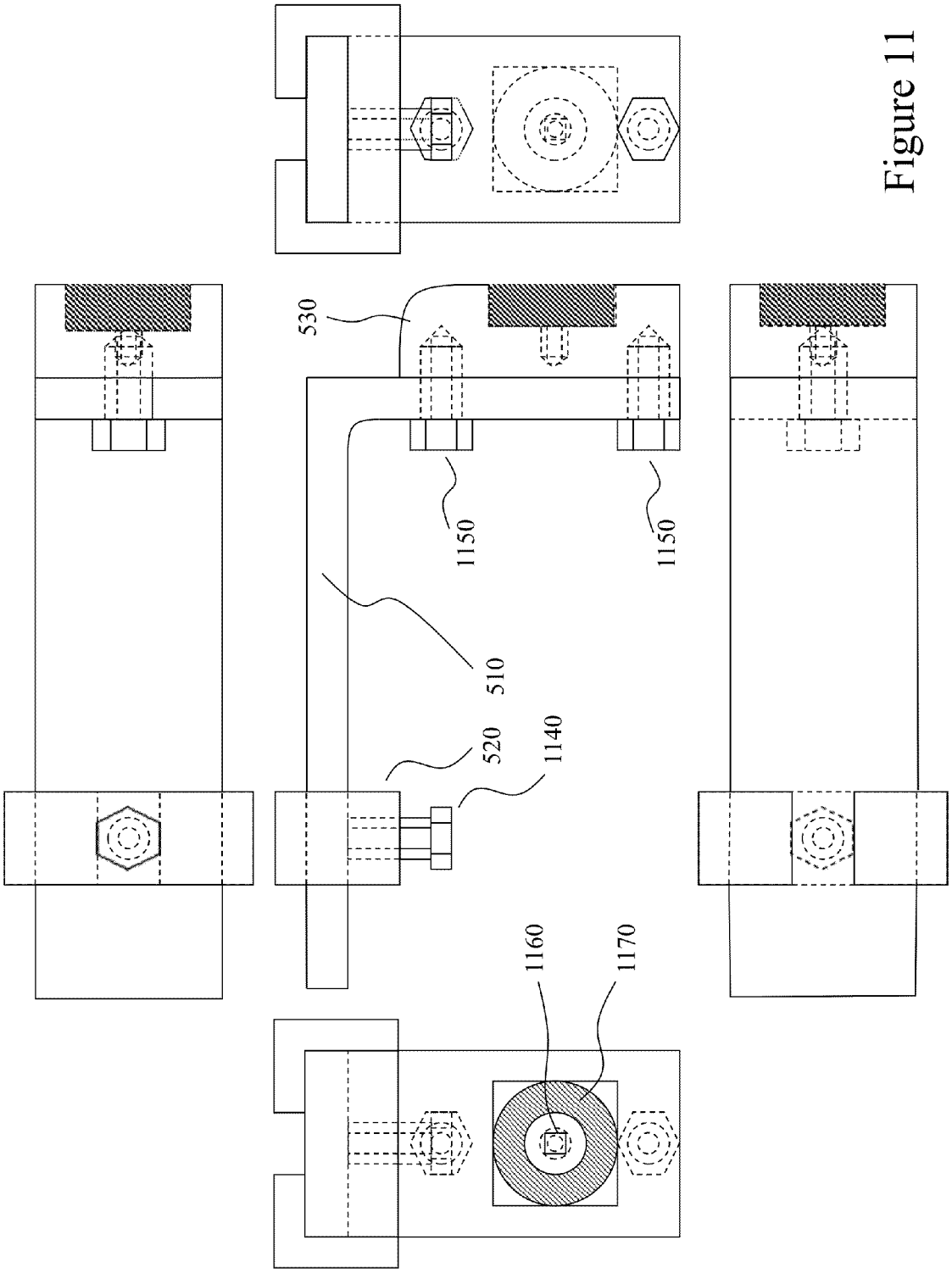


Figure 11

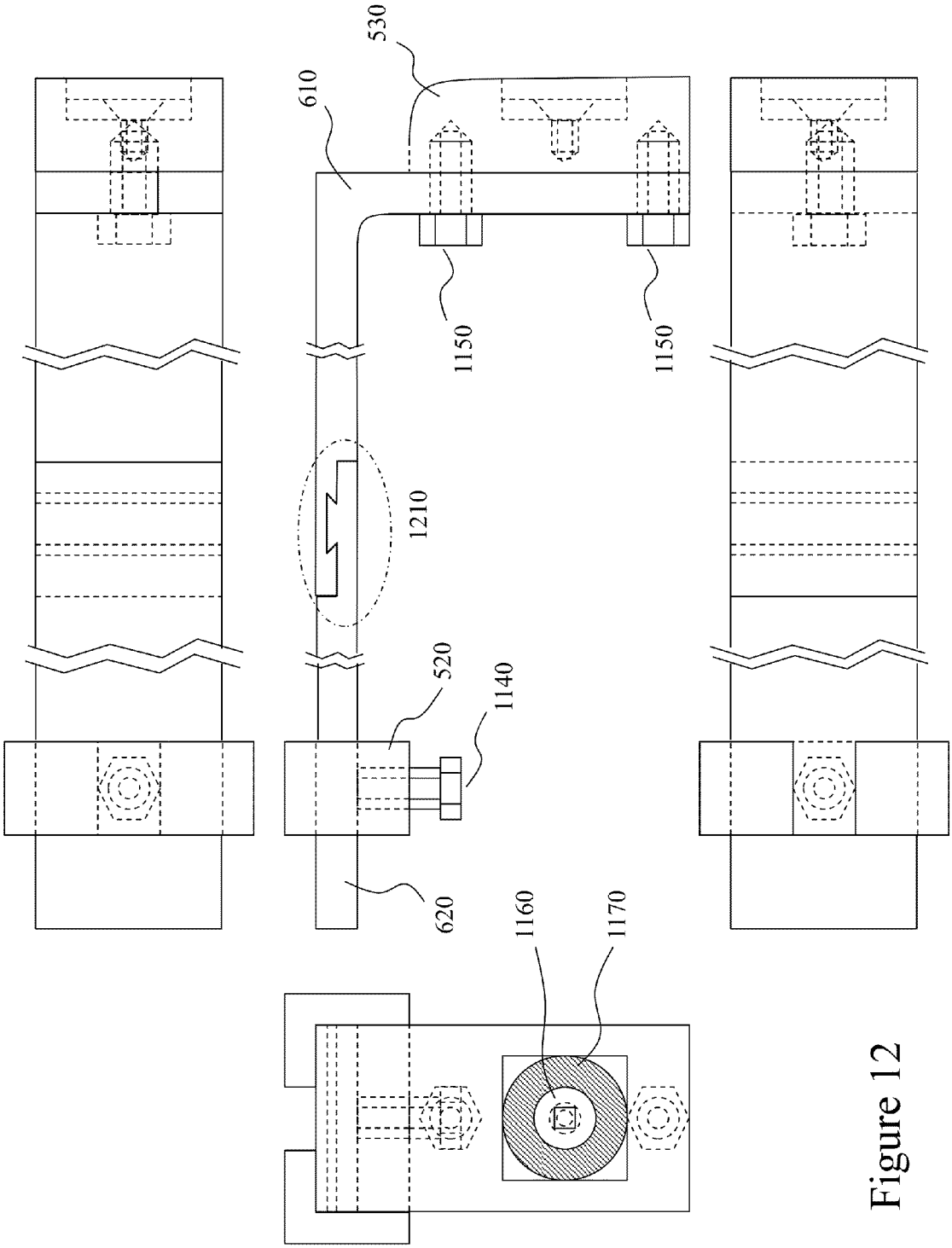


Figure 12

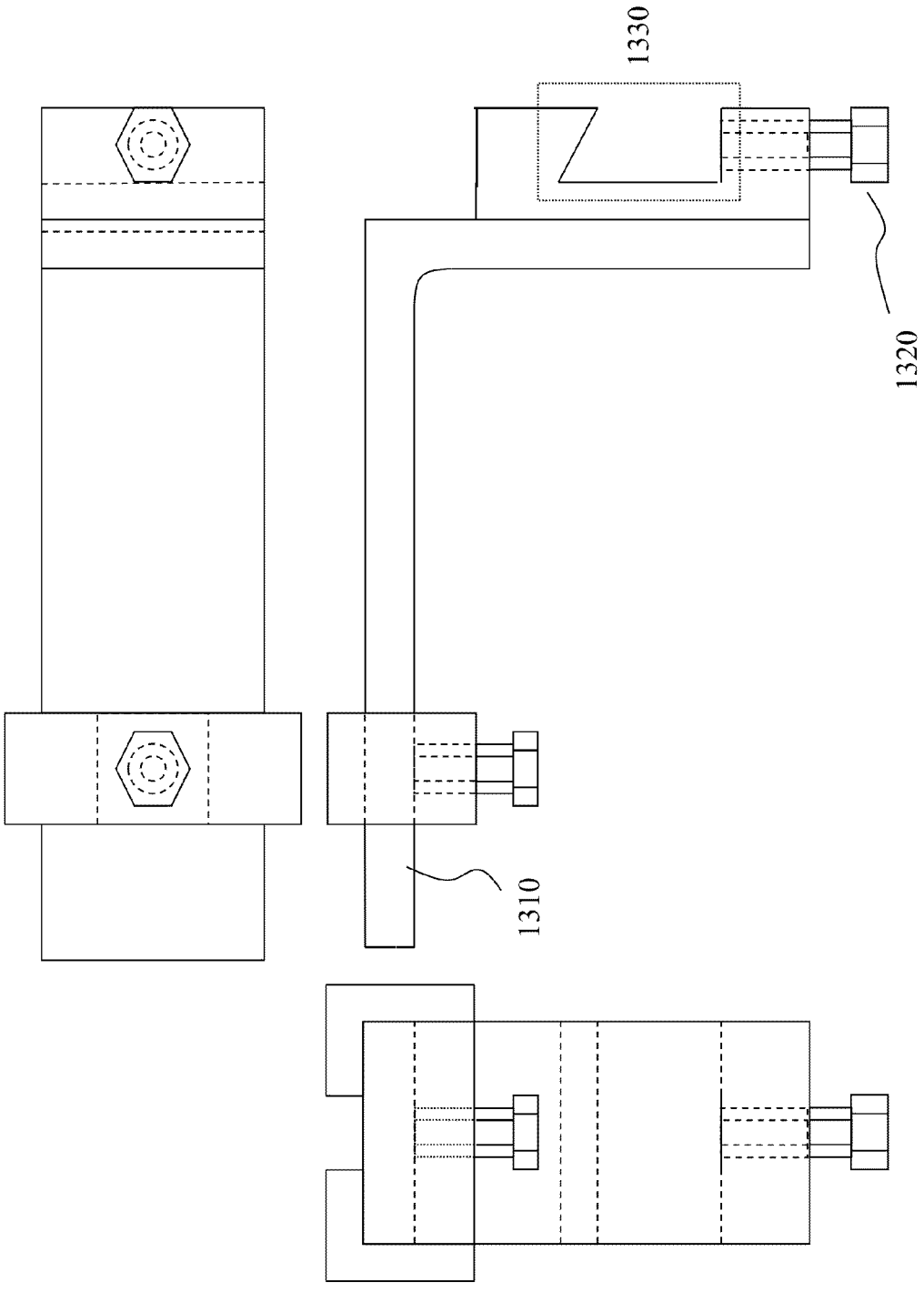


Figure 13

GAUGE KITS FOR SHEET BENDING BRAKES

RELATED APPLICATION

This application claims priority under 35 USC 119 from U.S. Provisional Application No. 61/763,016 filed Feb. 11, 2013.

FIELD OF THE INVENTION

This invention relates to sheet bending brakes, and more particularly to demountable and fixed gauges for measuring sheet material to be bent or cut in a sheet bending brake.

BACKGROUND

A sheet metal bending brake, commonly referred to as a brake, typically consists of a flat surface (bottom member) onto which the material (sheet metal) is placed, and a clamping bar which will come down and hold the material firmly during the bending process. This clamping action may be manual, automatic or operated using a foot pedal. The front, gate-like, plate of the machine is hinged and may be lifted, forcing the material extended over a straight edge to bend to follow the plate. The bends may be to any angle up to a typical practical limit of about 120 degrees, somewhat more in the case of a bar folder. If the area to be bent is narrow enough, a sharper bend (e.g., for a hem) can be made by inserting the bend under the clamping bar and lowering it.

The frame of such a brake is typically comprised of an interconnected series of flattened C-shaped members that open frontward and hold the top and bottom members at corresponding top and bottom lips of the C-shape. The flattened C-shaped members being rigidly connected to longitudinal members forming part of the brake frame. Sheet bending brakes of this character are well known, and many are designed to be portable so that they can be transported for use at temporary work sites, typically to be set up on sawhorses or the like. Therefore, such brakes must be rugged, and any accessories must likewise be rugged and also capable of being quickly and easily assembled and disassembled, if the accessories protrude from the main body of the brake, or adapted to meet the requirements of the current sheet metal bending required.

Currently, commercial sheet bending brakes are generally available with lengths from approximately 2 meters (approximately 6.5 feet) to 4.5 meters (approximately 14.5 feet). Typically, an approximately U-shaped handle is provided on top for actuating the clamping/unclamping action of the top member. Similarly, a pair of straight handles, or alternatively U-shaped or other shaped handles, hang downward from the bending member such that an operator can reach down, grasp the handle, and pivotably lift it to bend the clamped sheet material over the bending anvil. Typically, the sheet material is 24" wide, possibly supplied from a coil or roll, and as a "workpiece" the sheet material extends forward out away from the top and bottom clamping members. The operator, typically a single individual, must align the desired bending line of the sheet material (workpiece) with the bending anvil, and then both support and hold in position the sheet material with one hand while reaching over to close the clamp with their other hand. Then the operator must reach down and pull up the bending member handle, possibly while still supporting the sheet material with one hand. Therefore, a problem associated with conventional sheet bending brakes is providing support for the sheet material extending in front of the brake. Particularly for longer pieces of sheet material, an assistant to the operator may be needed, but of course this adds to labor costs.

This issue is exacerbated where, with typical sheet material being 24" wide, a 1" bend requires that the flattened C-shaped members of the frame accept 23" of sheet material. As such, for the brake to accommodate the fullest range of bends then the frame should essentially accommodate 24" minus the smallest length of the bent section, for example 0.5'. Accordingly, it would be beneficial for the brake frame and flattened C-shaped members to be large enough to support the range of bends desired by the user but have minimum footprint for ease of storage etc.

Another problem associated with conventional sheet bending brakes lies in squaring sheet material with respect to the bending anvil as the sheet material is inserted into the brake. That is, it is generally desired that bends or cuts in the sheet material made with the assistance of the sheet bending brake be square and parallel to an edge of the sheet material and to each other. Making the cuts or bends square to the material edge can be a time-consuming operation, resulting in undesirable expense and scrap. Accordingly, it would be beneficial for the operator to have rapid simple visual assurance that the sheet was square within the bending brake prior to committing to the bend.

Another problem with conventional sheet bending brakes is the labor and expense associated with formation of compound bends (including hems) in the sheet material when forming building trim elements and the like. For example, it is conventional practice to employ a ruler or scale to make marks at the ends of a length of sheet material, and to use these opposed marks in an effort not only to square the sheet material in the bending brake but also to locate the positions of the desired bends or cuts. For compound bends, marks may need to be made on both sides of the sheet. Another conventional technique is to employ a small strip of material, such as scrap material, to form the desired contour or profile of the trim element, including multiple bends and hems as desired. When the strip has been bent to a satisfactory contour, it is then flattened again in such a way that the stresses imparted to the strip material at each bend are plainly visible as marks on the flattened strip, thereby generating a "template strip". The template strip is then placed in turn along each end of the sheet of material to be contoured and manual cutters or snips are used to mark the longitudinally spaced material ends at lateral positions at which the material sheet is to be bent or cut. After the sheet is bent and cut, the ends having the snip marks usually must be trimmed off. It is self-evident that this is a time-consuming and expensive operation that undesirably increases the costs of building construction. Accordingly, it would be beneficial to provide a means of allowing the brake operator to perform bending operations without marking the sheet material reducing time required per bend but also reducing waste from incorrect measurements. In some instances where the brake user regularly performs similar operations it would be beneficial to provide them with quick visual markers for aligning the sheet metal thereby further reducing required time and waste. It would also be beneficial to provide the user with easily adjustable and accurately settable gauges and other aids or accessories could significantly improve an operator's efficiency in such situations.

Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying figures.

SUMMARY

It is an object of the present invention to mitigate limitations in the prior art relating to sheet bending brakes, and more particularly to demountable and fixed gauges for measuring sheet material to be bent or cut in a sheet bending brake.

In accordance with an embodiment of the invention there is provided a kit comprising a body for mounting to the bending bar of a sheet bending brake comprising a first mounting means for mounting to the bending bar and a first predetermined portion of a second mounting means for mounting a gauge plate, a gauge plate comprising a second predetermined portion of the second mounting means and an upper surface against which sheet material being bent within the sheet bending brake will be supported, and a stop dimensioned to slide along the gauge plate and comprising a third mounting means to reversibly lock the stop to the gauge plate.

In accordance with an embodiment of the invention there is provided a kit comprising a gauge plate comprising a first mounting means and an upper surface against which sheet material being bent within the sheet bending brake will be supported, the first mounting means supporting mounting of the gauge plate to a bending bar of a sheet bending brake, and a stop dimensioned to slide along the gauge plate and comprising a second mounting means to reversibly lock the stop to the gauge plate.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention will now be described, by way of example only, with reference to the attached Figures, wherein:

FIG. **1** depicts operation of a brake according to the prior art;

FIG. **2** depicts an example of a prior art brake;

FIG. **3** depicts schematically operation of a prior art brake;

FIG. **4** depicts a brake according to an embodiment of the invention;

FIG. **5** depicts a brake according to an embodiment of the invention with a demountable gauge and stop means;

FIGS. **6** and **7**A depict brakes according to embodiments of the invention with user extendable demountable gauges and stop means;

FIG. **7**B depicts a brake according to an embodiment of the invention with multiple demountable gauges;

FIG. **8** depicts a brake according to an embodiment of the invention with mounted gauge and stop means;

FIG. **9** depicts a brake according to an embodiment of the invention with mounted extendible gauge and stop means;

FIG. **10** depicts a brake according to an embodiment of the invention with continuous gauge;

FIG. **11** depicts a demountable gauge and stop means according to an embodiment of the invention as employed in FIG. **5**;

FIG. **12** depicts a demountable gauge and stop means according to an embodiment of the invention as employed in FIGS. **6** and **7**;

FIG. **13** depicts a demountable gauge and stop means according to an embodiment of the invention for use with a different brake bar configuration.

DETAILED DESCRIPTION

The present invention is directed to sheet bending brakes, and more particularly to demountable and fixed gauges for measuring sheet material to be bent or cut in a sheet bending brake.

The ensuing description provides exemplary embodiment(s) only, and is not intended to limit the scope, applicability or configuration of the disclosure. Rather, the ensuing description of the exemplary embodiment(s) will provide those skilled in the art with an enabling description for implementing an exemplary embodiment. It being understood that various changes may be made in the function and arrangement of elements without departing from the spirit and scope as set forth in the appended claims.

A "sheet bending brake" (brake) as used herein and throughout this disclosure, refers to a metalworking machine that allows the bending of sheet metal. A brake as employed within the specification and descriptions relating to embodiments of the invention are primarily associated with cornice brakes, which allow for simple bends and creases to be formed within a sheet material. However, a brake may also refer to a box-and-pan brake, allowing the formation of box and pan shapes; a press brake or brake press, allowing formation of bends using a punch and die; and a bar folder, which typically clamps and bends in a single motion, although the depth is usually less than cornice or box-and-pan brakes provide. A brake may also be known as a bending machine or bending brake.

FIG. **1** depicts the operation of a brake, specifically a cornice brake, according to the prior art in first to fifth images **100**A to **100**E respectively. Whilst FIG. **1** depicts a hydraulic brake the sequence of steps are the same as with a manual brake. As depicted in first image **100**A, the brake comprises upper clamp **110**, frame **120**, and bending plate **130**. Next in second step **100**B the sheet material **140** is brought between the upper clamp **110** and frame **120** before being positioned at the right location in step **100**C. The bending plate **130** is now pivoted as depicted in fourth image **100**D from its rest position to the desired angle on the plate wherein as the bending plate **130** moves the sheet material forms the bend within the sheet material where the corner of the bend forms at the forward edge of the upper clamp **110**. Bending plate **130** is typically rotated to angles between 30° and 120° according to the desired profile to be formed. Once rotated to the desired angle the bending plate **130** is returned to its original position as shown in fifth image **100**E wherein the bent sheet material **150** is removed from the brake and the process either repeated on the same piece of sheet material to add another bend or with a new piece of sheet material.

Now referring to FIG. **2** there is depicted an example of a prior art manual portable brake **200**. As shown brake **200** comprises a rectangular sub-frame **210** upon which a plurality of flattened C-frames **220** are mounted along the length of the sub-frame **210**. Attached to each flattened C-frame **220** is a mount **230** projecting forward to which is attached the upper clamp **250**. Also mounted to the frame **210** is bending plate **260**, this mounting being via an approach that allows the bending plate **260** to pivot about the mounting such that the bending plate **260** may be raised such that sheet material inserted into the open sides of the flattened C-frames **220** is bent against the upper clamp **250**. Also attached to the upper portions of the flattened C-frames **220** via bar **270** is handle **240**. Not shown, for clarity, are the handle attached to the bending plate **260** for the user to grip and pull-push during the bending operation.

Referring to FIG. **3** there is depicted schematically the operation of a prior art brake, such as brake **200** described supra in respect of FIG. **2**. As shown, a flattened C-frame **310** has a lower clamp plate **320**A on its lower side and an upper clamp **320**B attached to its upper portion wherein the sheet material **340**A is inserted between them. The bending plate is depicted in this instance with the handle and three positions,

these being base position **330**A, first position **330**B, and end position **330**C. As the bending plate **330** is rotated about pivot (mounting) **350** then between first position **330**B and end position **330**C it is folding the sheet material **340**A to bent sheet **340**B. As such the bending plate **330** must be rotated an initial angle, e.g. 90°,between base position **330**A and first position **330**B, before being rotated the desired angle of the bend, e.g. 90°, 120°, or 60°. Accordingly, it would be evident that between base position **330**A and first position **330**B effort/time is wasted moving the bending plate **330** for no effect upon the sheet material **340**A.

Now referring to FIG. **4** there is depicted a brake **400** according to an embodiment of the invention. As depicted a conventional brake **200**, such as described supra in respect of FIG. **2**, as attached to the front surface of the bending plate **260** a series of gauges **420**A through **420**D respectively allowing the brake operator to determine the correct position for the sheet material prior to bending it as well as verifying that the sheet material has the correct orientation to the bending plate **260** and upper clamp **250**. This may typically be that the edge of the sheet material is parallel to the upper clamp **250** although it would be evident that the series of gauges **420**A through **420**D may be also marked, as described below in respect of FIG. **10** for example, in a manner to support other predetermined angular offsets between upper clamp **250** and sheet material edge.

Referring to FIG. **5** there is depicted a brake according to an embodiment of the invention with a demountable gauge and stop means. The depicted portions of the brake being flattened C-frame **310**, lower frame element **320**A, and upper clamp **320**B whilst other elements have been omitted for clarity. Towards the front of lower frame element **320**A a pivot **350** supports a bending plate **330**A such as described supra in respect of FIGS. **2** and **3**. Attached to bending plate **330**A is gauge and stop assembly **500**. Gauge and stop assembly **500** comprises body **530**, bracket **510**, and stop **520**. Body **530** as depicted contains a magnet **540** to mount the gauge and stop assembly **500** to the bending plate **330**A which in this instance may be made from steel or austenitic stainless steel. Accordingly, the upper surface of the bracket **510**, denoted as surface **510**A, supports the sheet material as the user is aligning and positioning it plus provides as discussed below in respect of FIG. **10** markings supporting the user making the bends in the correct positions. Additionally, stop **520** may be positioned and fixed into position on bracket **510** allowing the sheet material to be positioned within increased ease. Accordingly, the gauge and stop assembly **500** is removed and the bending plate **330**A rotated to bend the sheet material to the desired angle.

Referring to FIGS. **6** and **7**A there are depicted first and second gauge and stop assemblies **600** and **700** attached to brakes according to embodiments of the invention. As discussed supra in respect of FIG. **5**, the depicted portions of the brake are flattened C-frame **310**, lower frame element **320**A, and upper clamp **320**B with other elements having been omitted for clarity. Towards the front of lower frame element **320**A a pivot **350** supports a bending plate **330**A such as described supra in respect of FIGS. **2** and **3** whilst attached to bending plate **330**A are first and second gauge and stop assemblies **600** and **700** respectively in FIGS. **6** and **7** respectively. Each of the first and second gauge and stop assemblies **600** and **700** comprises a body **530** with magnet **540** for mounting the respective assembly to the bending plate **330**A. Referring to FIG. **6**, then attached to the body **530** is bracket **610** which terminates away from the brake with first predetermined portion of an attachment means **630**. Accordingly, the gauge provides a first range of lengths for the user of the brake. However, attachment of plate **620** to bracket **610** provides for an extension of the gauge length. Plate **620** comprises at one end a second predetermined portion of the attachment means. However, as evident in FIG. **7**A an extender plate **710** may be attached to the end of bracket **510** and then plate **620** attached to the extender plate thereby providing for a further increase in gauge length.

Alternatively, a plurality of different length gauge extension plates may be attached to bracket **610** as depicted in FIG. **7**B wherein first to third custom plates **720** to **740** respectively are attached by common attachment means **630** to the bracket **610**. As discussed below in respect of FIG. **10**, gauge may have ruled dimensions upon their upper surface allowing the brake user to determine where to place the edge of the sheet material or be marked with other text/markings which make the process easier for the user. Accordingly, first to third custom plates **720** to **740** respectively may be provided to reflect different bend designs being processed and simply require that the brake user align the sheet material edge to a permanent stop **750** attached to the plate or that the brake user attach the stop **520** to the end or with respect to a mark on the plate.

Referring to FIG. **8** there is depicted in first and second images **800**A and **800**B operation of a brake according to an embodiment of the invention with mounted gauge and stop means. As depicted in first image **800**A a bracket **510**, such as described above in respect of FIG. **5**, is attached to the bending plate **330**A directly without body **530** and hence without magnet **540** for demountable gauge attachment. Accordingly, rotation of the bending plate now pushes the bracket **510** against the sheet material and begins bending the sheet material at the edge of the upper clamp **320**B as the bending plate **330**A is rotated 90° as shown in second image **800**B. Accordingly, bracket **510** performs the bending of the sheet material rather than the bending plate **330**A as within a prior art brake as discussed supra in respect of FIGS. **2** and **3**. Beneficially, in this configuration the stop **520** prevents slippage of the sheet material away from the brake.

Referring to FIG. **9**, there is depicted a brake according to an embodiment of the invention such as described supra in respect of FIG. **6** with mounted extendible gauge and stop means although as with FIG. **8** the body **530** with magnet **540** has been removed and the bracket **610** directly attached to the bending plate **330**A. Accordingly, as depicted in first and second images **900**A and **900**B respectively, rotation of the bending plate **330**A by 90° as opposed to 180° bends the sheet material at the desired point. Now referring to FIG. **10**, there is depicted a brake **200** with bending plate **260**, such as described supra in respect of FIG. **2**, modified according to an embodiment of the invention with Continuous Gauge **1010** attached to the bending plate **260**. First and second details **1000**A and **1000**B respectively depict details of Continuous Gauge **1010** wherein within first detail **1000**A a ruled section **1020** of the Continuous Gauge **1010** allows the user to make the desired bend by aligning the edge of the sheet material at the desired distance. In contrast, second detail **1000**B first to third marks **1030**A to **1030**C respectively denote positions for the edge of the sheet material which are denoted by identifiers of the bend/product being manufactured rather than a ruled gauge. Accordingly, the user can see that for each of the "Master Flow" (M'Flow) and "Verplas" products the first bend is made with the sheet material at first mark **1030**A. However, for these products the second bends are made at different positions as denoted by second and third marks **1030**B and **1030**C respectively for the "M'Flow" and "Verplas" products respectively. In this manner, repetitive bends in standard geometries may be identified upon the gauges and

allow for reduced error/waste as working with the ruled gauge is replaced with simple clear markers. In some instances of the invention it would be evident that a manufacturer may sell as set of gauges commercially allowing, for example, HVAC engineers to repair their ducting products or make custom fittings to interface to their standard ducting etc.

Now referring to FIG. **11**, there is depicted a demountable gauge and stop means according to an embodiment of the invention such as described supra in respect of FIG. **5** with the body **530** and without in FIG. **8**. As depicted, the bracket **510** is attached to the body **530** via hex-head screws **1150** although other attachment means may be employed without departing from the scope of the invention. Similarly stop **520** is locked into position on bracket **510** using bolt **1140** and magnet **1170** retained within body **530** by flat head bolt **1160**. Similarly, referring to FIG. **12**, there is depicted a demountable gauge and stop means according to an embodiment of the invention such as described supra in respect of FIG. **6** with the body **530** and without in FIG. **9**. In this instance, the bracket **610** is attached to the body **530** via hex-head screws **1150** although other attachment means may be employed without departing from the scope of the invention. Similarly, stop **520** is locked into position on bracket **610** or plate **620** using bolt **1140** and again the magnet **1170** is retained within body **530** by flat head bolt **1160**. The plate **620** is attached to the bracket **610** by tongue-and-groove mounting **1210** although it would be evident that other mounting means may be employed without departing from the scope of the invention.

Now referring to FIG. **13** there is depicted a demountable gauge and stop means according to an embodiment of the invention for use with a different brake bending bar configuration wherein the bracket **1310** mounts to the bending bar, not shown for clarity, through mount **1330** and may be mounted/removed with ease or locked with retaining bolt **1320**. It would be evident that in other embodiments of the invention a range of bodies, such as described supra in respect of FIGS. **4** to **7**B and FIG. **11**, may be provided as part of a kit allowing a set of gauges with or without extender plates to be mounted to a variety of brakes supplied by one or more manufacturers.

Specific details are given in the above description to provide a thorough understanding of the embodiments. However, it is understood that the embodiments may be practiced without these specific details. Implementation of the techniques, blocks, steps and means described above may be done in various ways.

The foregoing disclosure of the exemplary embodiments of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Many variations and modifications of the embodiments described herein will be apparent to one of ordinary skill in the art in light of the above disclosure. The scope of the invention is to be defined only by the claims appended hereto, and by their equivalents.

Further, in describing representative embodiments of the present invention, the specification may have presented the method and/or process of the present invention as a particular sequence of steps. However, to the extent that the method or process does not rely on the particular order of steps set forth herein, the method or process should not be limited to the particular sequence of steps described. As one of ordinary skill in the art would appreciate, other sequences of steps may be possible. Therefore, the particular order of the steps set forth in the specification should not be construed as limitations on the claims. In addition, the claims directed to the method and/or process of the present invention should not be limited to the performance of their steps in the order written, and one skilled in the art can readily appreciate that the sequences may be varied and still remain within the spirit and scope of the present invention.

The invention claimed is:

1. A kit comprising:

a body for mounting to the bending bar of a sheet bending brake comprising a first mounting means for mounting to the bending bar and a first predetermined portion of a second mounting means for mounting a gauge plate to said bending bar;

said gauge plate comprising a second predetermined portion of the second mounting means and an upper surface against which sheet material being bent within the sheet bending brake is supported; and

a stop dimensioned to slide along the gauge plate and comprising a third mounting means to reversibly lock the stop to the gauge plate.

2. The kit according to claim **1** further comprising;

a first predetermined portion of a fourth mounting means disposed at a second distal end of the gauge plate for demountably attaching an extender gauge plate to the gauge plate;

the extender gauge plate cross-sectionally dimensioned for compatibility with the gauge plate to allow the stop to move between gauge plate and extender gauge plate, the extender gauge plate also comprising an upper surface against which sheet material being bent within the sheet bending brake will be supported.

3. The kit according to claim **2** wherein the extender plate is one of a plurality of extender plates, each extender plate at least one a different length and having at least a mark of a plurality of marks upon its upper surface, each mark of the plurality of marks relating to the position of a bend to be induced by the sheet bending brake relative to an edge of the sheet of material within which the bend will be made.

4. The kit according to claim **2** further comprising;

a first predetermined portion of a fifth mounting means disposed at a second distal end of the extender gauge plate for demountably attaching another extender gauge plate to the extender gauge plate, wherein the other extender gauge plate is cross-sectionally dimensioned for compatibility with both the gauge plate and extender gauge plate to allow the stop to move between extender gauge plate and another extender gauge plate, the extender gauge plate also comprising an upper surface against which sheet material being bent within the sheet bending brake will be supported.

5. The kit according to claim **1** wherein the upper surface of the gauge plate comprises at least a mark of a plurality of marks relating to the position of a bend to be induced by the sheet bending brake relative to an edge of the sheet of material within which the bend will be made.

6. The kit according to claim **1** wherein the first mounting means is a magnet.

7. A kit comprising:

a gauge plate comprising a first mounting means and an upper surface against which sheet material being bent within the sheet bending brake will be supported, the first mounting means supporting mounting of the gauge plate to a bending bar of a sheet bending brake; and

a stop dimensioned to slide along the gauge plate and comprising a second mounting means to reversibly lock the stop to the gauge plate.

8. The kit according to claim 7 further comprising;

a first predetermined portion of a third mounting means disposed at a second distal end of the gauge plate for demountably attaching an extender gauge plate to the gauge plate;

the extender gauge plate cross-sectionally dimensioned for compatibility with the gauge plate to allow the stop to move between gauge plate and extender gauge plate, the extender gauge plate also comprising an upper surface against which sheet material being bent within the sheet bending brake will be supported.

9. The kit according to claim 8 wherein the extender plate is one of a plurality of extender plates, each extender plate at least one a different length and having at least a mark of a plurality of marks upon its upper surface, each mark of the plurality of marks relating to the position of a bend to be induced by the sheet bending brake relative to an edge of the sheet of material within which the bend will be made.

10. The kit according to claim 8 further comprising;

a first predetermined portion of a fourth mounting means disposed at a second distal end of the extender gauge plate for demountably attaching another extender gauge plate to the extender gauge plate, wherein the other extender gauge plate is cross-sectionally dimensioned for compatibility with both the gauge plate and extender gauge plate to allow the stop to move between extender gauge plate and another extender gauge plate, the extender gauge plate also comprising an upper surface against which sheet material being bent within the sheet bending brake will be supported.

11. The kit according to claim 7 wherein the upper surface of the gauge plate comprises at least a mark of a plurality of marks relating to the position of a bend to be induced by the sheet bending brake relative to an edge of the sheet of material within which the bend will be made.

12. The kit according to claim 7 wherein the bending bar movable between a first position and a second position wherein an angle between the first position and the second position is 90° resulting in a 90° bend being induced within sheet material.

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